The IEEE Registration Authority Committee (RAC) working with the IEEE 1451.2, Standard for a Smart Transducer Interface for Sensors and Actuators—Transducer to Microprocessor Communication Protocols and Transducer Electronic Data Sheet (TEDS) Format, Working Group has established procedures on how transducer producers should submit proposals requesting extension TEDS ID numbers.

IEEE Std 1451.2 defines a set of specifications for smart connectivity between transducers (sensors or actuators) and microprocessors through the introduction of the TEDS concept. A TEDS is the manufacture data for the transducer and may include the manufacturer's name, type of transducer and uncertainty, etc. as well as optional calibration parameters, if required for the device.

Interested parties can send application to the IEEE RAC TEDS ID Program by writing to the Institute of Electrical and Electronics Engineers, Inc. 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331 USA, or call 1-732-562-1571.

The following describes a procedure to support the Generic Extension TEDS data block specified in clause 5.8 of IEEE 1451.2 standard.

**Proposed procedure:**

1) Applicant sends IEEE and the 1451.2 working group an Industrial Extension TEDS proposal.

2) The 1451.2 working group reviews the Industry Extension TEDS proposal and contacts the applicant with feedback regarding any suggested changes within three weeks of receiving the proposal.

3) The applicant waits until hearing from the 1451.2 working group before submitting a final version to IEEE. The applicant considers any suggested changes and may contact the 1451.2 working group for further discussions regarding any suggested changes.

4) If feedback from the 1451.2 working group indicates that the requirements of clause 5.8 have not been met the applicant shall make the required changes. When ready, the applicant submits the final Industry Extension proposal to the working group and to IEEE.

5) IEEE assigns a unique number to the extension after receiving the final version from the applicant and sends the assigned number to the applicant and the 1451.2 working group.

This number shall be assigned consecutively starting at 256.

**IEEE responsibilities:**

1) Receive initial and final applications for Industrial Extensions from applicants.

2) Assign numbers to the finalized Industrial Extensions proposals.

3) Maintain a record of the assigned numbers and the contents of the Industrial Extensions proposals.

**IEEE 1451.2 working group responsibilities:**

1) Review proposals and give feedback to the applicant within three weeks of receiving the initial proposal.

2) Notify IEEE when feedback has been sent back to the applicant.

**Applicant responsibilities:**

1) Abide by clause 5.8 when designing Industry Extensions
   a) Define a data structure conforming to Table 47 and subsequent field descriptions.
   b) Follow the requirement in clause 5.8.3.4 when defining STRINGs.

2) Submit an initial proposal to both IEEE and the 1451.2 working group.

3) Acknowledge receipt of any comments from the 1451.2 working group.

4) Submit the final proposal to both IEEE and the 1451.2 working group.

**Example Industrial Extensions proposal:**

Title: Low-pass filter specification extension TEDS

| Field # | Description | Type | # bytes |
|---|---|---|---|
| 1 | Extension TEDS Length | U32L | 4 |
| 2 | Extension TEDS ID Number | U16E | 2 |
| 3 | Extension TEDS Version Number | U16E | 2 |
| 4 | Filter Characteristic | U8E | 1 |
| 5 | Filter Ripple | F32 | 4 |
| 6 | Filter Passband edge | F32 | 4 |
| 7 | Filter Stopband edge | F32 | 4 |
| 8 | Filter Stopband minimum attenuation | F32 | 4 |
| 9 | Checksum for the Extension TEDS | U16C | 2 |

Field 1 Extension TEDS length

This field shall contain the 32-bit integer 23

Field 2 Extension TEDS ID Number

This field shall contain the 16-bit integer <TBD by IEEE>

Field 3 Extension TEDS Version Number

This field shall contain the 16-bit integer 0

Field 4 Filter Characteristic

This field shall be determined by the following table

| Filter Characteristic | enum value |
|---|---|
| unspecified | 0 |
| Butterworth | 1 |
| Chebyshev | 2 |
| Cauer (Inverted Chebyshev) | 3 |
| Elliptic | 4 |
| Bessel | 5 |
| Guassian | 6 |

Field 5 Filter Ripple

This field shall represent the peak-to-peak deviation, in bels, of the filter attenuation in the passband. This shall always be a positive number.

Field 6 Filter Passband edge

This field shall represent the maximum frequency, in Hz, for which the filter attenuation is less than the filter ripple specified in field 5.

Field 7 Filter Stopband edge

This field shall represent the minimum frequency, in Hz, where the attenuation exceeds the Stopband minimum attenuation specified in field 8.

Field 8 Filter Stopband minimum attenuation

This field shall represent the minimum attenuation, in bels, for all frequencies greater than the filter stopband edge (field 7).

Field 9 Checksum

The checksum shall be the one's complement of the sum (modulo 216) of all the data structure's preceding bytes, including the initial length field and excluding the checksum field.